

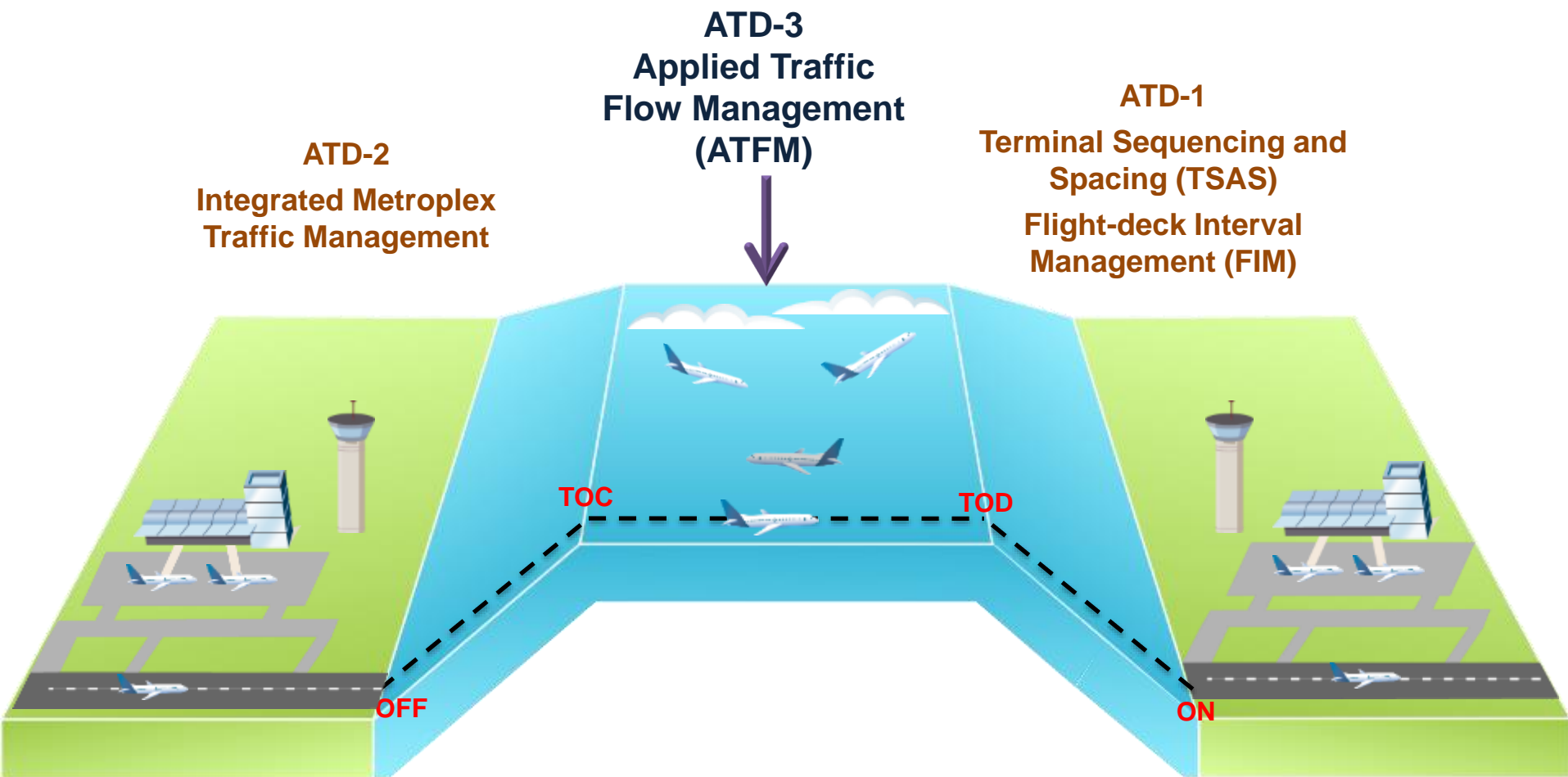
Airspace Technology Demonstration 3 (ATD-3): Applied Traffic Flow Management

Project Overview

August 31, 2016

Chester Gong
NASA Ames Research Center

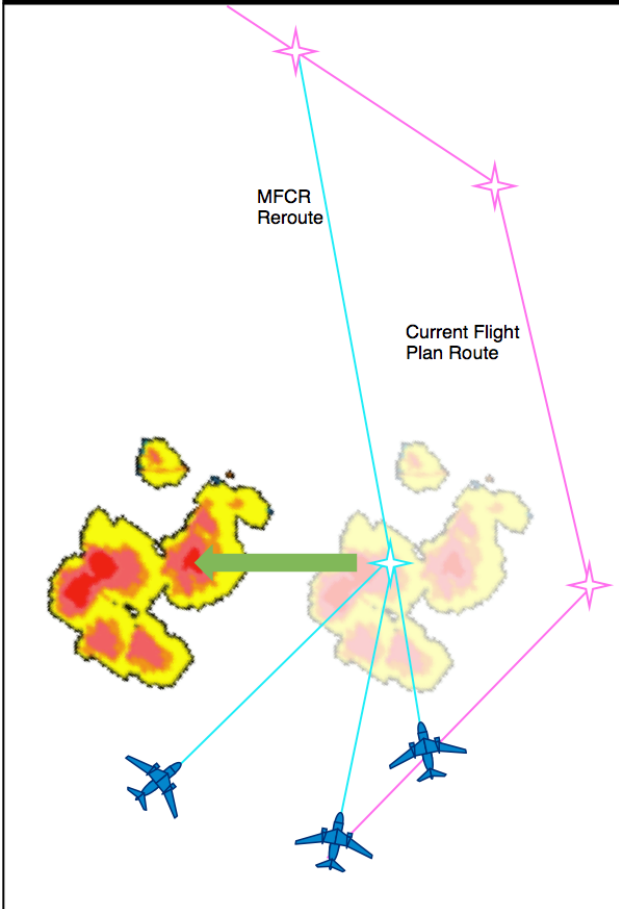
ATD-3 Scope



Reduce weather-induced delays through integration of weather information to better manage aircraft, traffic flow, airspace and schedule constraints by delivering air/ground procedures and user-tool technologies.

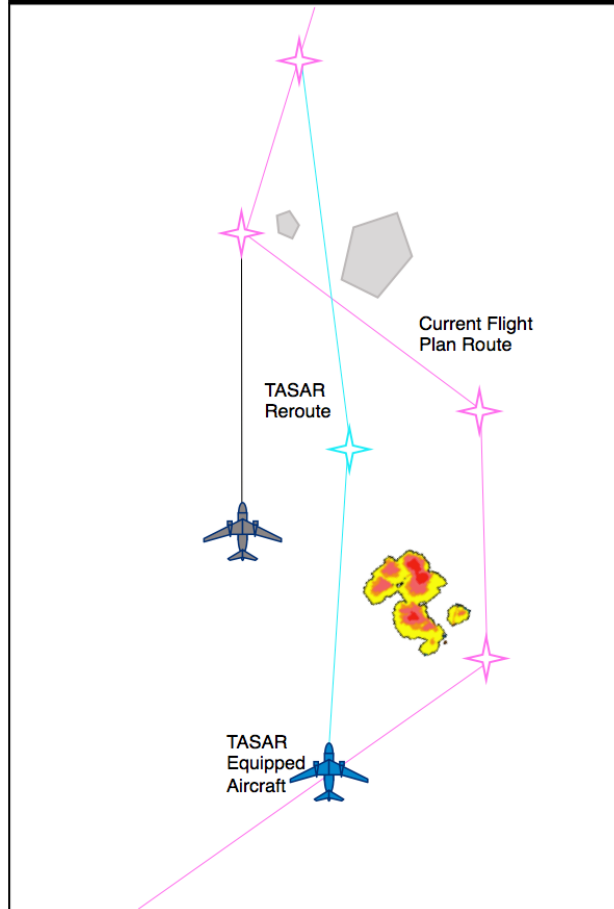
Multi-Flight Common Route (MFCR):

Automated search for efficient high value reroutes for individual flights and common reroutes for multiple flights - delay recovery from stale TMLs.



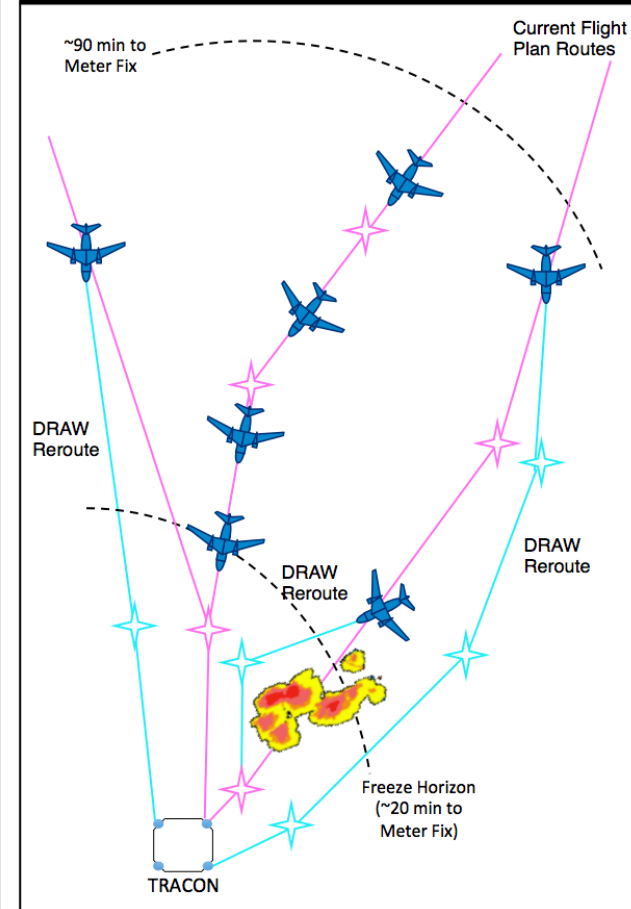
Traffic Aware Strategic Aircrew Requests (TASAR):

Airborne automated continuous searching for efficient reroutes that reduce fuel and/or flight time, avoid interactions with traffic, weather and restricted airspace.

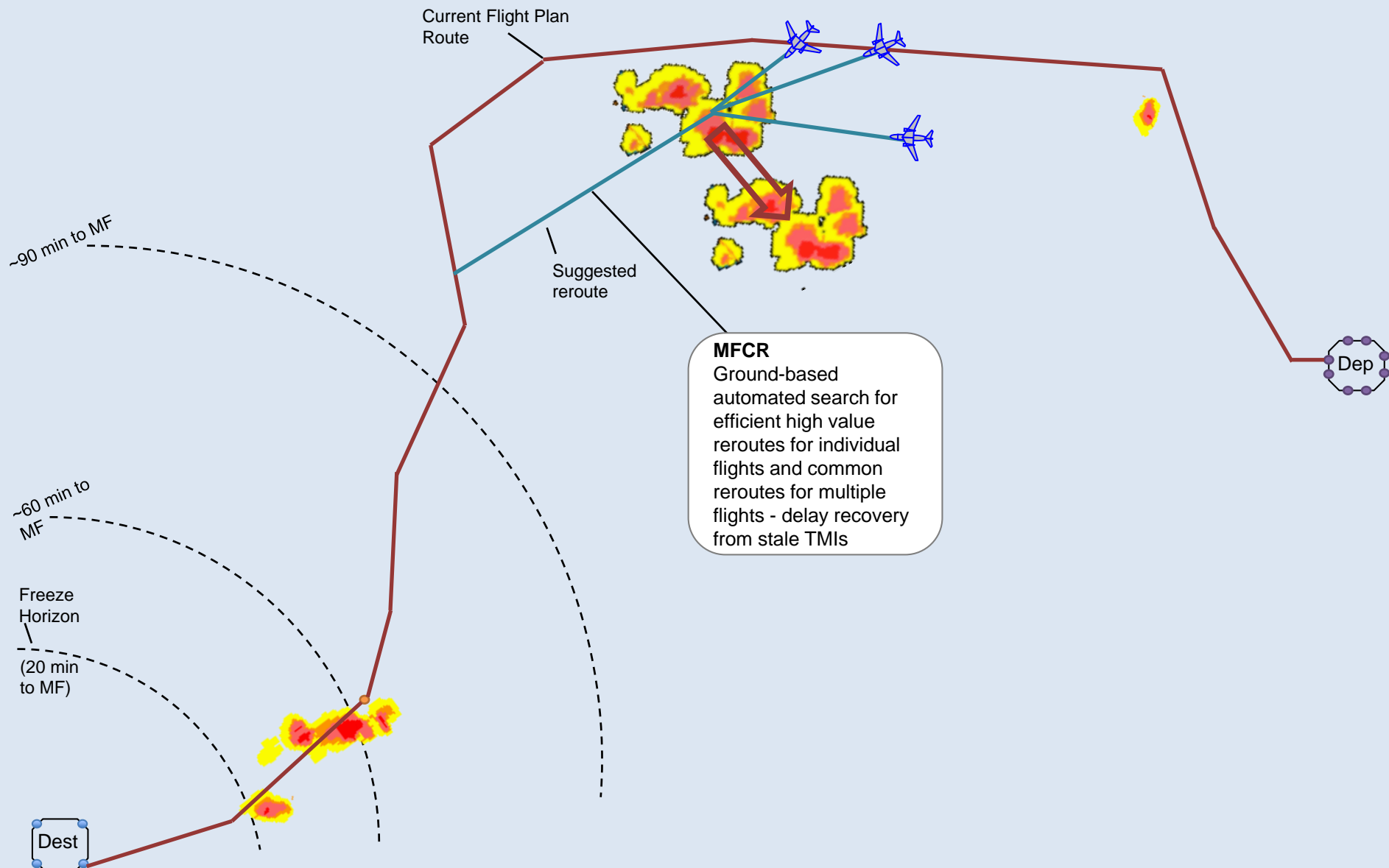


Dynamic Routes for Arrivals in Weather (DRAW):

Efficient reroutes to maintain metering operations in the presence of weather, find efficient arrival routes, and balance meter fix demand.

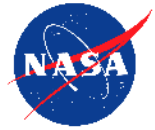


ATD-3 Integrated Concept





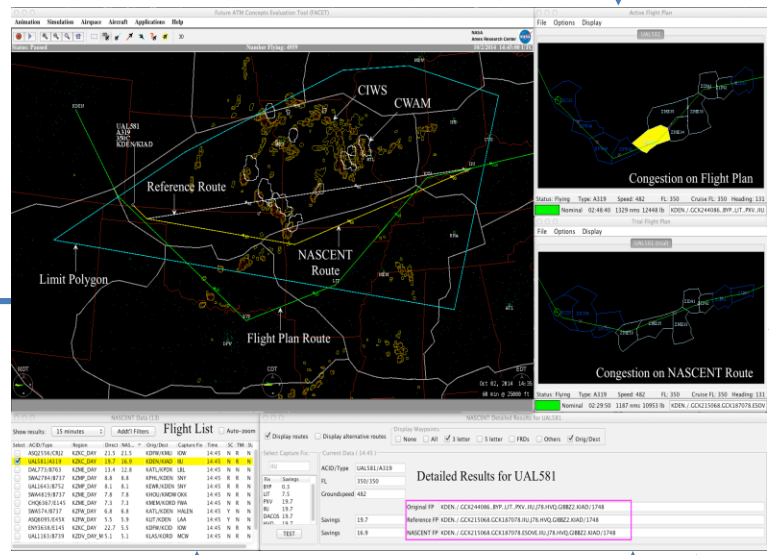
MFCR Architecture Diagram



Dispatch or
Traffic Management Coordinator



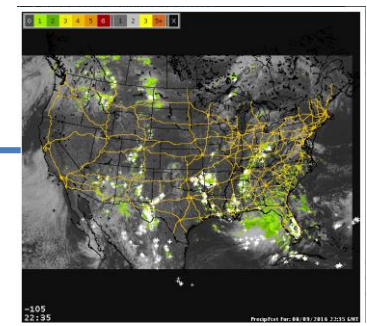
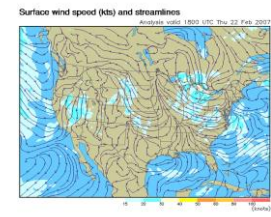
AOC or ARTCC



MFCR



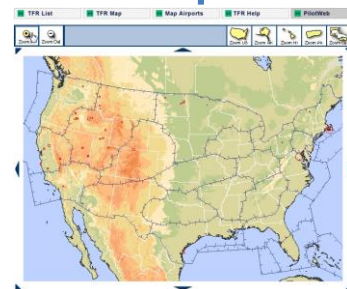
Rapid Refresh Wind Model (NOAA)



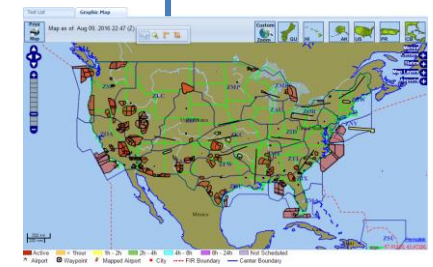
CIWS



TFM Data (via SWIM)

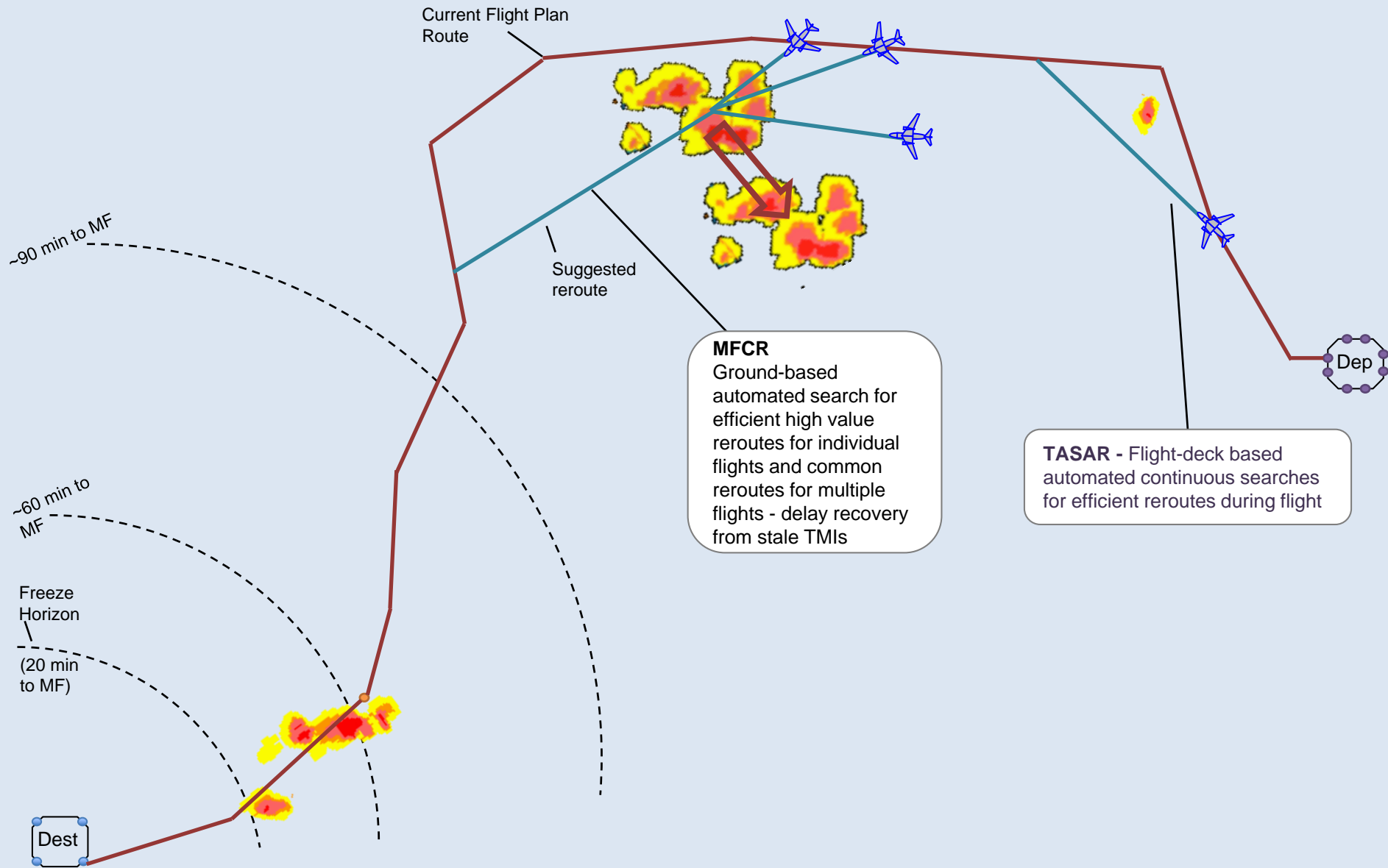


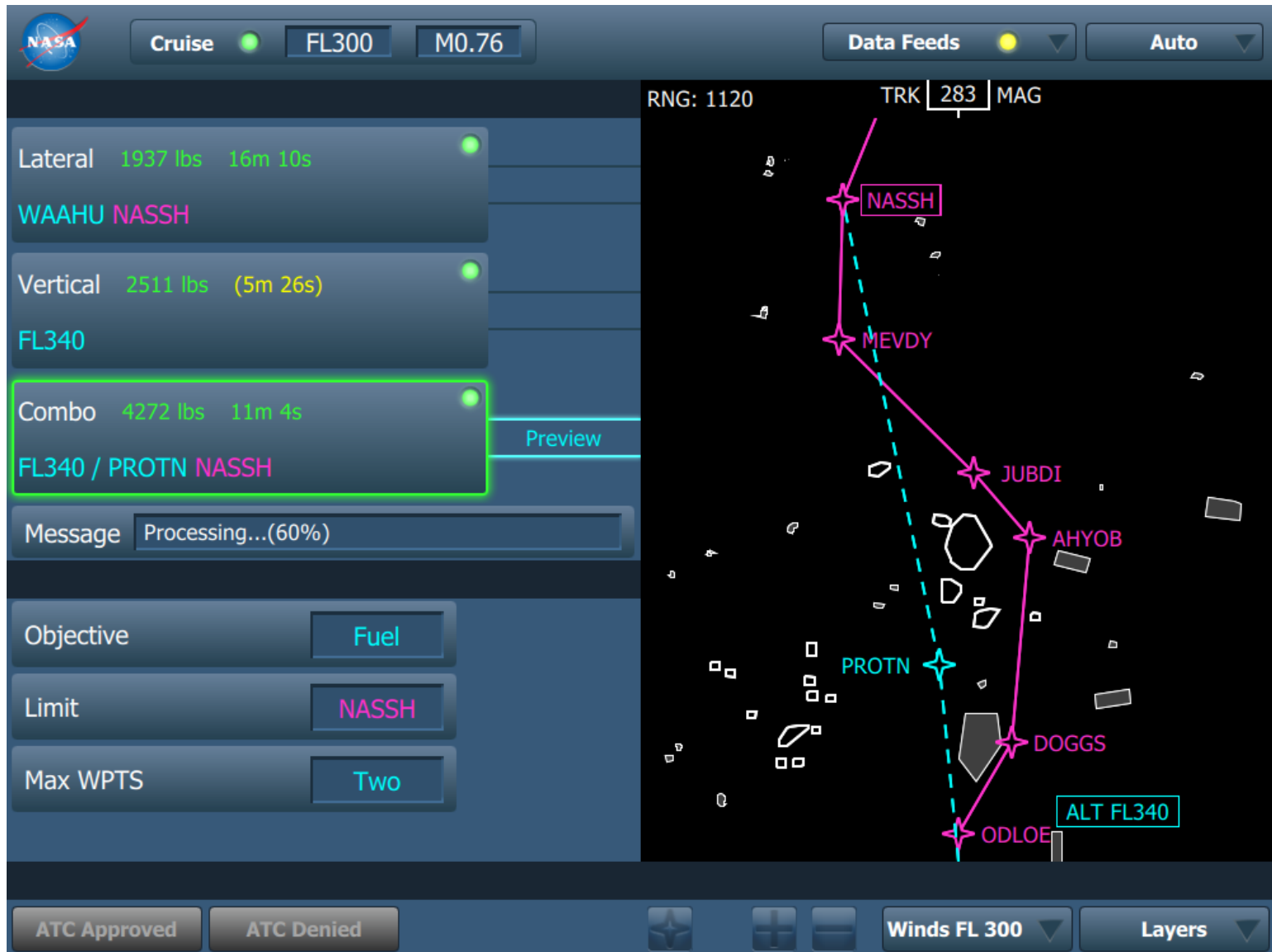
TFR System (FAA)



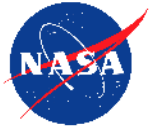
SUA System (FAA)

ATD-3 Integrated Concept

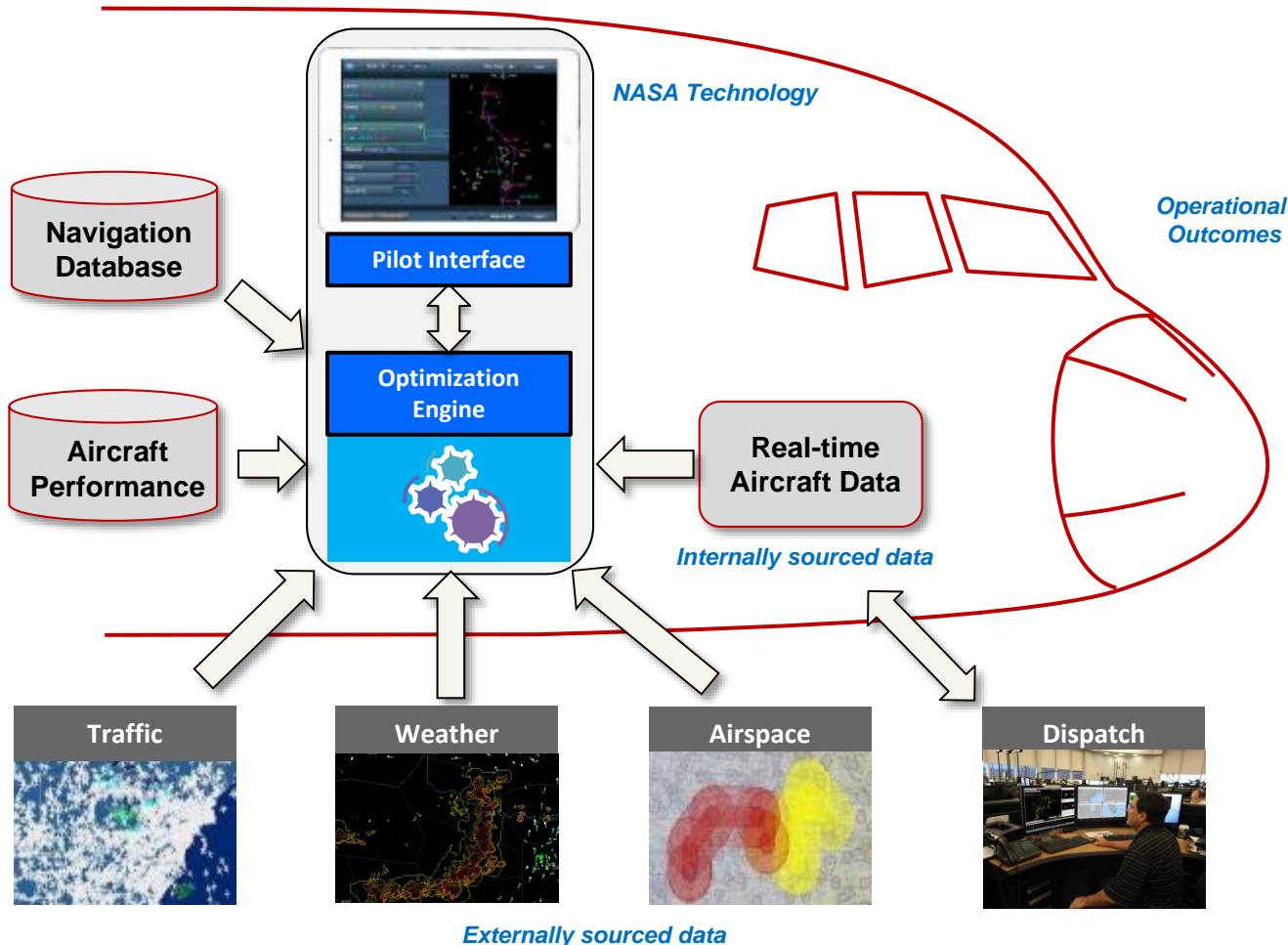




Traffic Aware Strategic Aircrew Requests (TASAR)



Pilot uses onboard automation tool to optimize an aircraft's trajectory



Greater flight efficiency
en route



Crew Request

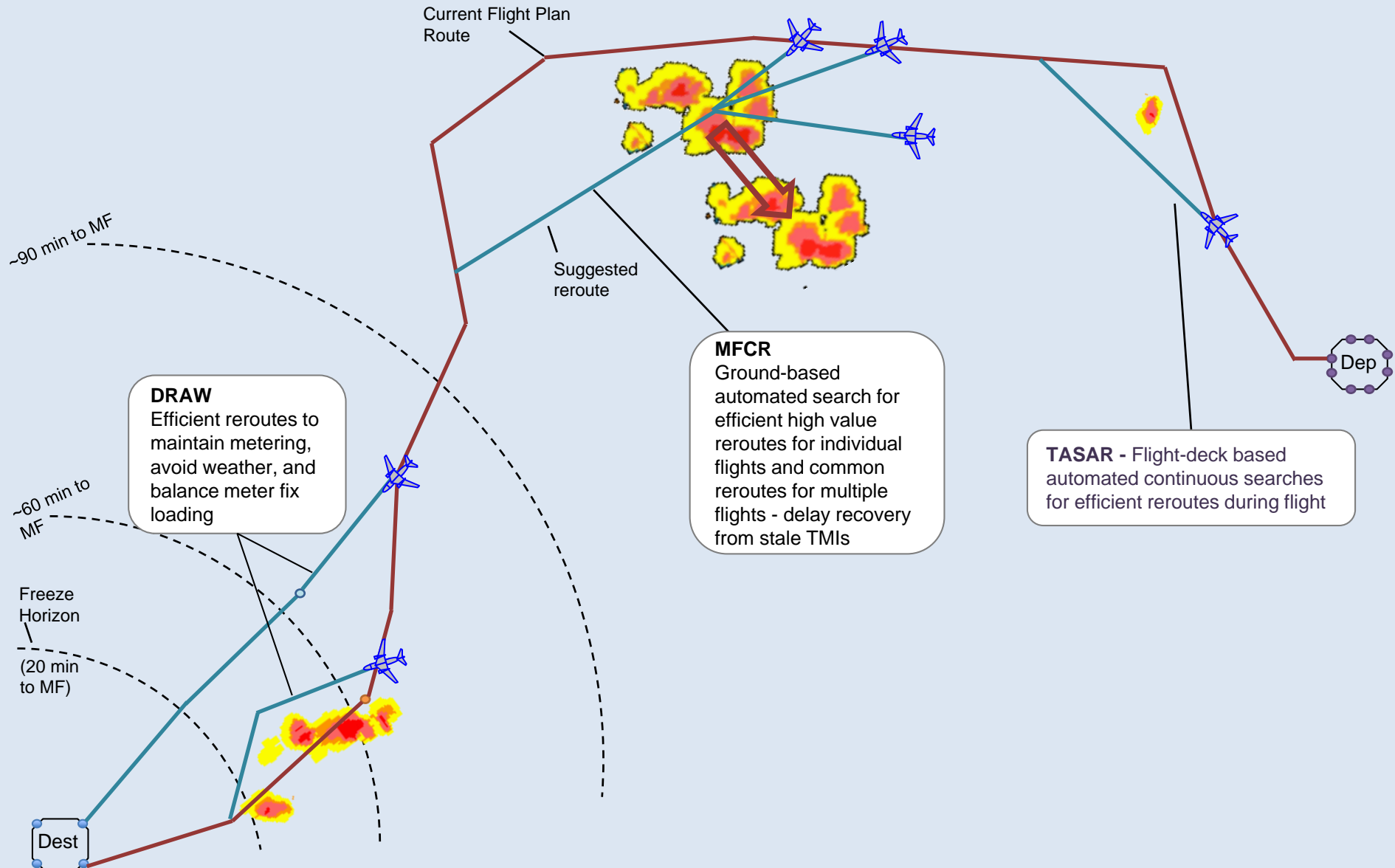
ATC Response



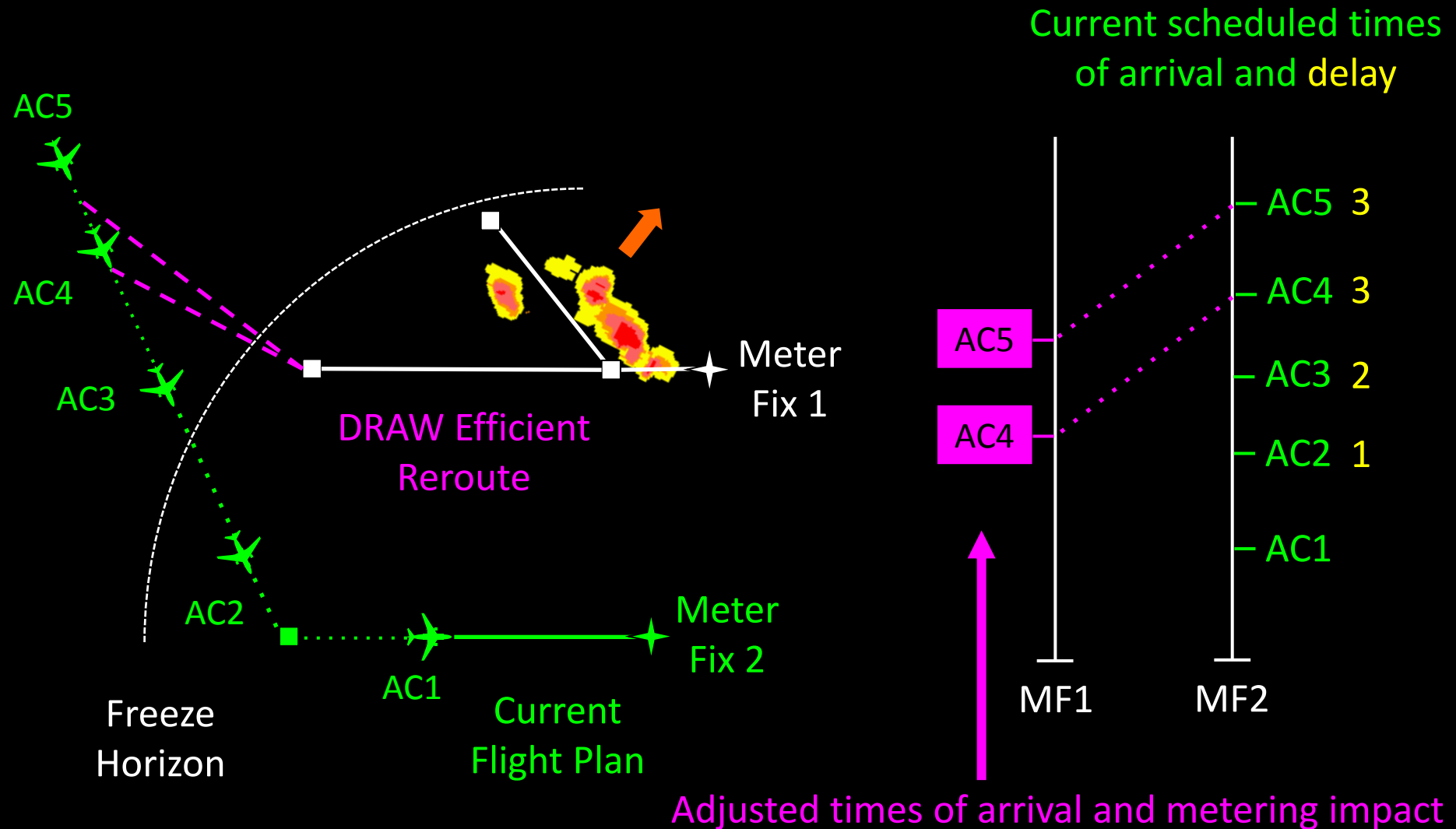
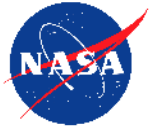
Increased ATC approval
of requests

Tool leverages networked connectivity to real-time operational data

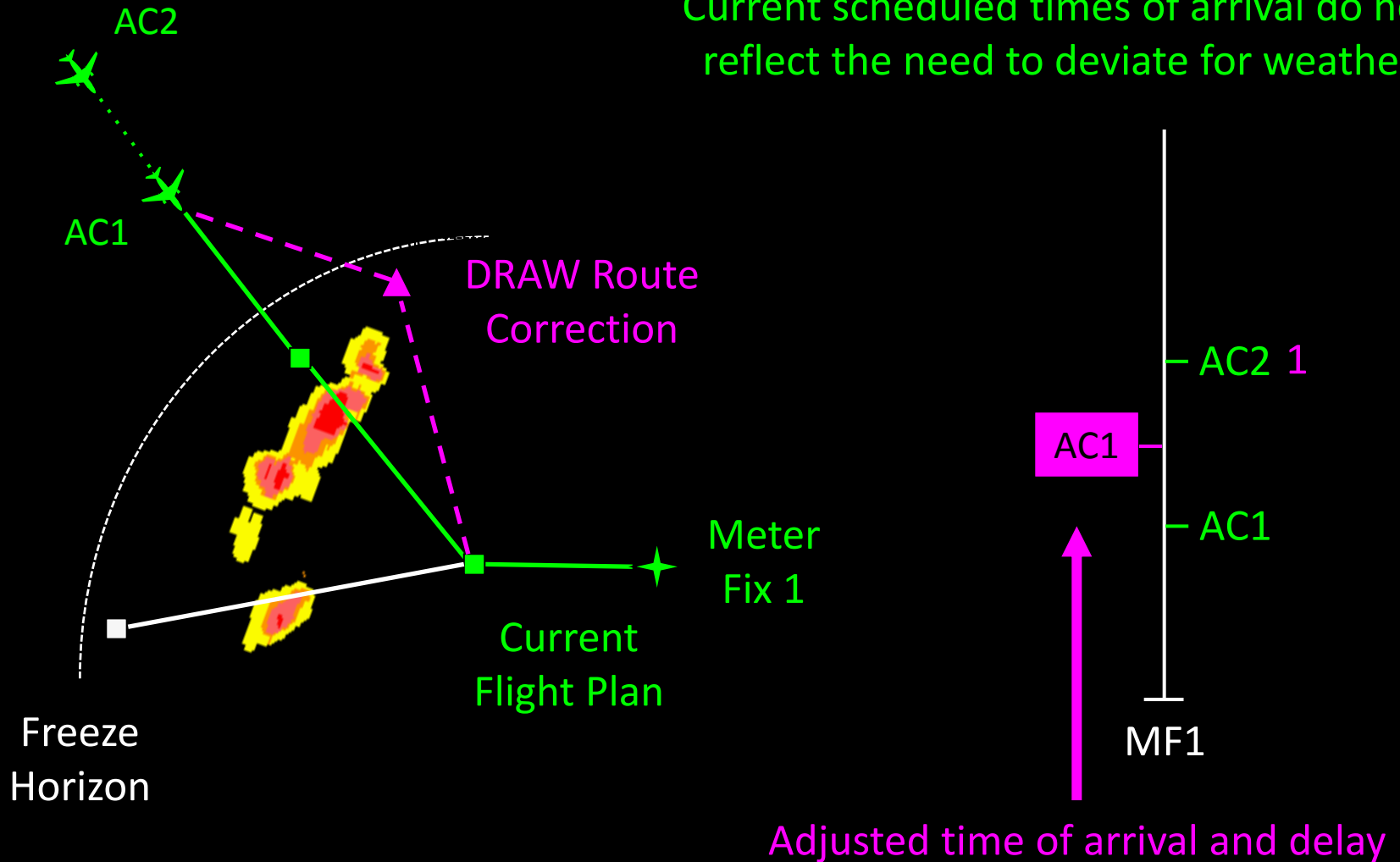
ATD-3 Integrated Concept



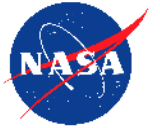
DRAW – Time-Saving Reroutes to Alternate Meter Fix



Current scheduled times of arrival do not reflect the need to deviate for weather



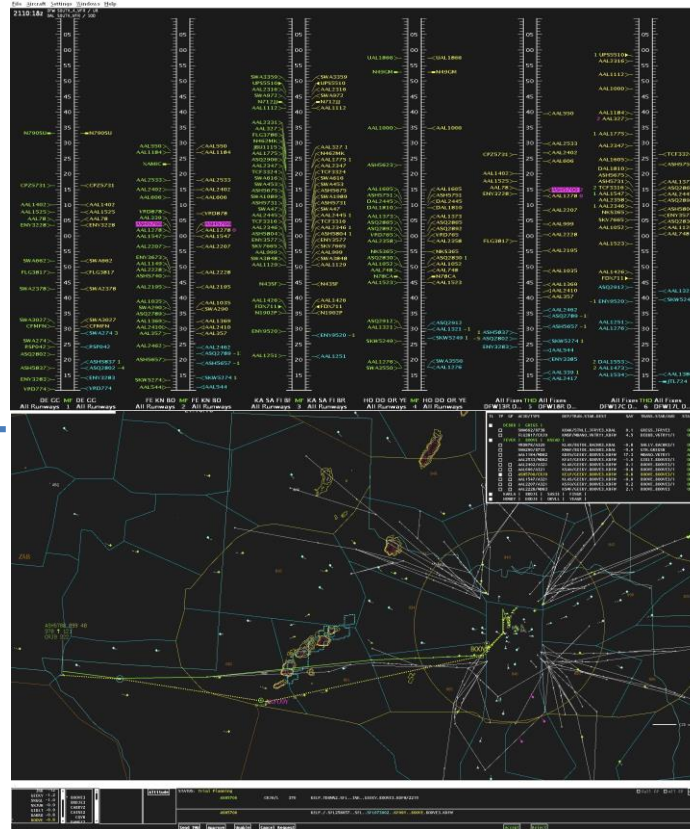
DRAW Architecture Diagram



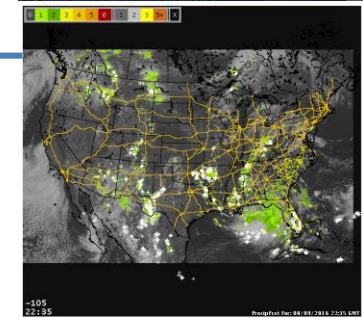
**Traffic Management Coordinator
In ARTCC**



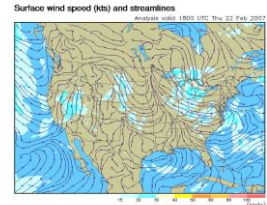
**Traffic Management Unit
In ARTCC**



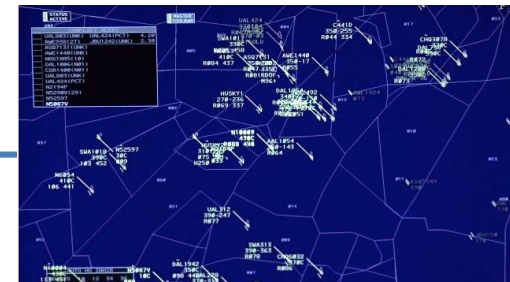
DRAW



CIWS

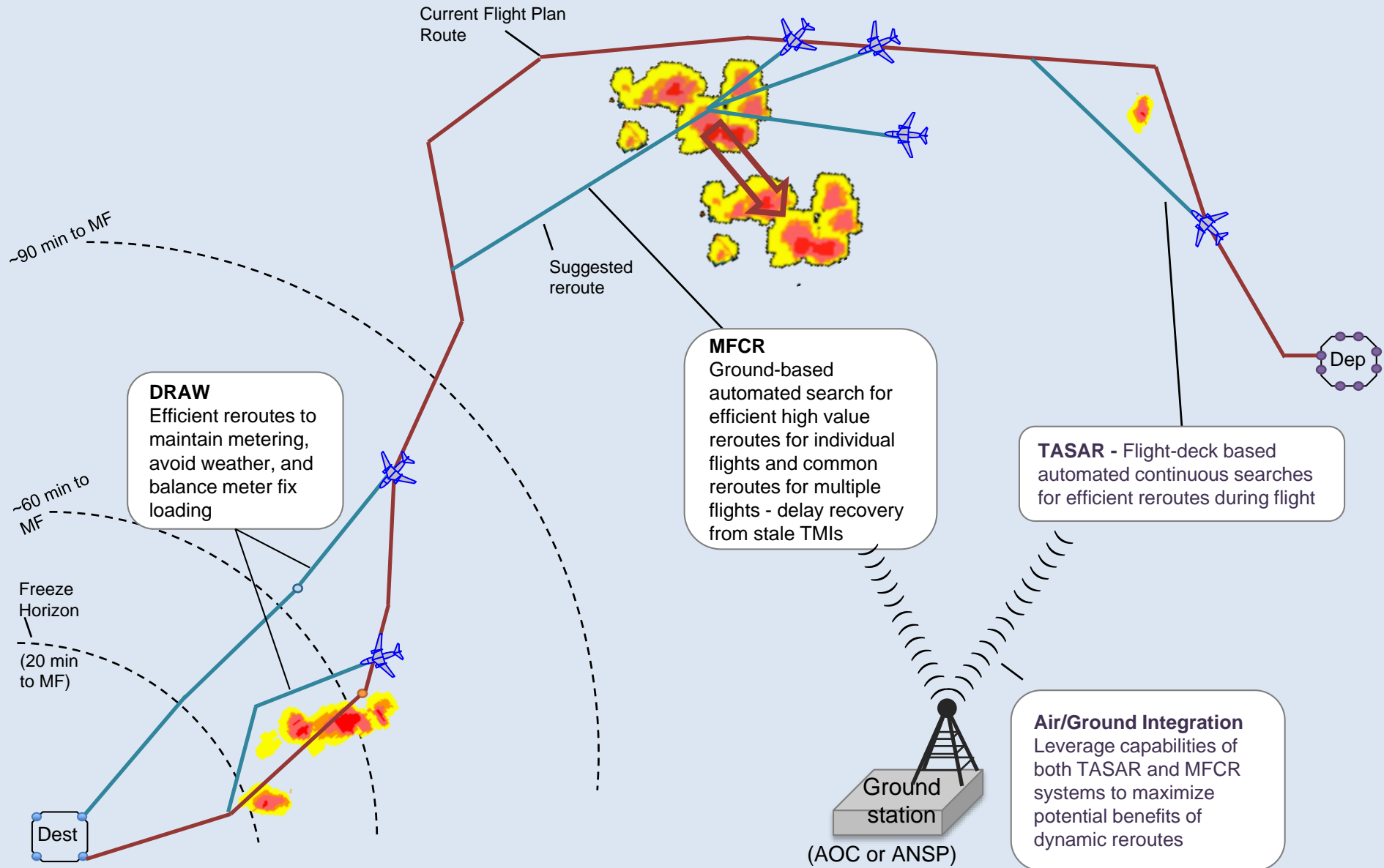
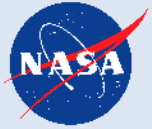


Rapid Refresh Wind Model (NOAA)



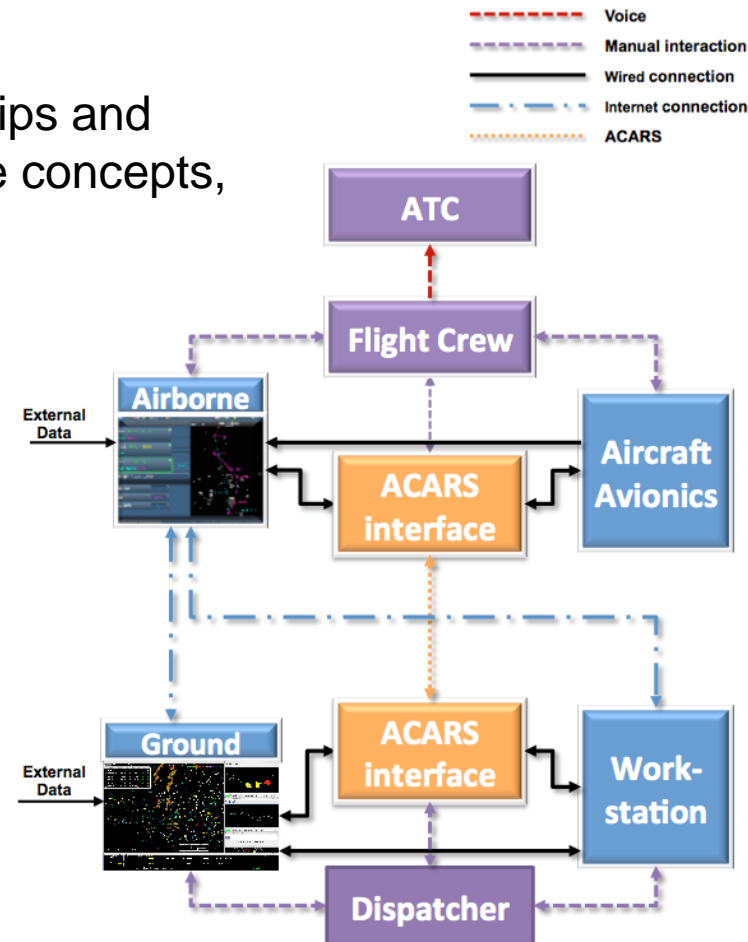
ERAM

ATD-3 Integrated Concept



Plan through Q2FY17

- Qualitative benefit assessment of candidate air/ground concepts
- Leveraging existing airline and FAA partnerships and agreements, solicit feedback on top candidate concepts, establish demonstration partnership(s)
- Develop Objectives, initial ConOps, and top-level requirements for air/ground concept and demonstration
- Complete Air/Ground Integration Plan through FY20 leading to demonstration



DRAW System Demonstration